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ASSIGNMENT BOOKLET 4A

MAT3038 Applied Mathematics 30
Module 4: Activities 1 to 4 Assignment

FOR STUDENT USE ONLY

Date Assignment Submitted: ______________

Time Spent on Assignment: ______________

(If label is missing or incorrect)

Student File Number: ______________

Module Number: ______________

FOR OFFICE USE ONLY

Assigned Teacher: ______________

Assignment Grading: ______________

Graded by: ______________

Date Assignment Received:

Student's Questions and Comments

Apply Module Label Here

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Please verify that preprinted label is for correct course and module.

Teacher's Comments

____
Teacher

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- Are all the assignments completed? If not, explain why.
- Has your work been reread to ensure accuracy in spelling and details?
- Is the booklet cover filled out and the correct module label attached?

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Send all letters in a separate envelope.

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2. All faxing costs are the responsibility of the sender.

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Module
4

Applied Mathematics 30

PERSONAL FINANCE

ASSIGNMENT BOOKLET 4A

Learning
Technologies
Branch

Alberta
LEARNING

FOR TEACHER'S USE ONLY

Summary

	Total Possible Marks	Your Mark
Activities 1 to 4 Assignment	90	

Teacher's Comments

Applied Mathematics 30
Module 4: Personal Finance
Assignment Booklet 4A
Activities 1 to 4 Assignment
Learning Technologies Branch
ISBN 0-7741-2229-3

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Students	✓
Teachers	✓
Administrators	
Home Instructors	
General Public	
Other	

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ASSIGNMENT BOOKLET 4A
APPLIED MATHEMATICS 30: MODULE 4
ACTIVITIES 1 TO 4 ASSIGNMENT

Your mark for this module will be determined in part by how well you do your assignments.

This Assignment Booklet is worth 90 marks out of the total 235 marks for the assignments in Module 4. The value of each assignment and each question is stated in the left margin.

Work slowly and carefully. If you have difficulty, go back and review the appropriate topic.

Be sure to proofread your answers carefully.

(90)

Activities 1 to 4 Assignment

Read all parts of your assignment carefully and record your answers in the appropriate places. Clearly show how you arrived at your answers by showing your work.

③ **1.** Bruni invests \$3400 in a GIC that pays 3.75%, compounded annually, for 4 years. How much money will Bruni receive when the GIC matures?

Return to page 15 of the Student Module Booklet and continue with Activity 1.

③ **2.** Complete exercise 6 of “Investigation 1: Watching Money Grow” on page 155 of the textbook. Attach a printout of your spreadsheet in the space provided.

Return to page 19 of the Student Module Booklet and continue with Activity 1.

③ **3.** Show the formulas of the spreadsheet you used to answer exercise 7.a. of "Exercises: Checking Your Skills" on page 159 of the textbook. To do this, select "Options" under the Tools menu. When the Options window appears, select "Formulas" in the Window Options section under the View tab; then click OK. Print the formulas, and attach your printout in the space provided. **Note:** You may need to adjust the column widths. If you are using a spreadsheet program other than Microsoft® *Excel*, consult the User's Guide.

Return to page 20 of the Student Module Booklet and continue with Activity 1.

4. Samantha borrows $5000 over a 12-month period from her bank at an annual rate of 8%, compounded monthly. She uses the money to make a contribution to her RRSPs for the year, which are earning 6% annually with a marginal tax rate of 44%. Samantha receives her tax rebate in time for her third monthly payment and wishes to add it to her regular payment. Her remaining payments are then recalculated to reflect the change in the amount owed.

③ **a.** How much of her own money (Samantha's initial investment) did she invest in RRSPs? Use the spreadsheet from "Investigation 1: The Power of RRSPs" to calculate the tax rebate, and develop a spreadsheet to show the life of the loan. Attach a printout of both spreadsheets in the space provided.

④ **b.** Calculate Samantha's net return and her average annual simple rate of return after 30 years. Attach a printout of the RRSP spreadsheet in the space provided.

Return to page 23 of the Student Module Booklet and continue with Activity 2.

③

5. Complete exercise 9 of “Investigation 2: So, You Want to Be a Millionaire!” on page 162 of the textbook. Attach a printout of your spreadsheet to justify your answer in the space provided.

Return to page 30 of the Student Module Booklet and continue with Activity 2.

④ **6.** Complete the following table, and calculate the average annual rate of return.

Investment	Amount Invested	Average Rate of Return	Amount of Return
Savings Account	$3 000	2.50%	
Canada Savings Bonds	$4 200	6.00%	
Guaranteed Investment Certificates	$6 900	6.50%	
Mutual Funds	$10 300	11.50%	
TOTALS			

③ **7.** Using the completed table in your answer to exercise 5 of "Exercises: Checking Your Skills" on page 172 of the textbook, what was the value of the portfolio at the end of 1994? Copy your completed table in the table provided.

Year	Opening Balance	Rate of Growth (%)	Closing Balance
1991	$10 000.00	8.2	
1992		11.7	
1993		14.6	
1994		(2.9)	
1995		33.1	

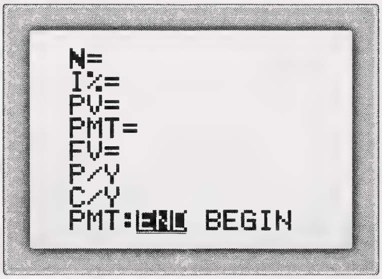
8. At the beginning of 1999, Bernice invested in a mutual fund. Its performance in each year of the 5 years Bernice held this investment is given in the following table.

Year	1999	2000	2001	2002	2003
Return	21%	4%	(42%)	10%	12%

③ **a.** If Bernice invested $20 000, how much is her investment worth at the end of 2003?

Year	1999	2000	2001	2002	2003
Return	21%	4%	(42%)	10%	12%
Closing Value					

③ **b.** Use the TVM Solver to determine the average compound rate of return over the 5-year period. Fill in the blank display given, and round your answer to 2 decimal places.



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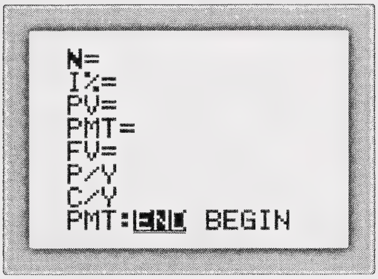
Return to page 33 of the Student Module Booklet and continue with Activity 3.

9. Erynn is thinking about leasing a new car that is listed at $19 999. To lease the car for 3 years, she must make a $2000 down payment. At an interest rate of 3.9%, her payments before taxes would be $299 a month.

③ **a.** Use the TVM Solver to determine the residual value of the car. Fill in the blank display.



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③ **b.** If she chooses to purchase this car for cash at the end of her lease, how much will she pay in total before taxes? What would her cost be with 7% GST and 6% PST included?

10. Use the spreadsheet you created in "Investigation 1: The Power of RRSPs" on pages 160 and 161 of the textbook to answer the following.

④ **a.** Dasan has $4000 to invest. He can either invest it in an RRSP or in a non-registered plan. Both plans offer an annual interest rate of 5%, compounded annually. If Dasan chooses to invest in RRSPs, he will re-invest the tax rebate from the first year in the second year. Any other tax rebates he receives he will keep for himself.

How much more would Dasan have after 25 years in the RRSP plan than he would have in the non-registered plan if his marginal tax rate is 40%?

① **b.** Attach a printout of the spreadsheet you used to answer question 10.a. in the space provided.

⑤

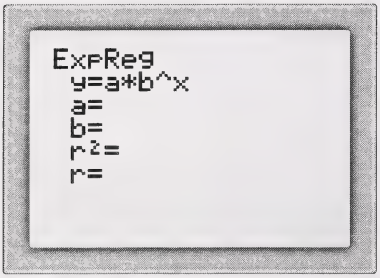
11. A locomotive mechanic has four investments. Complete the table and calculate the average annual rate of return.

Investment	Amount Invested	Rate of Return	Amount of Return
Savings	$5 000	3.5%	
GICs	$20 000	5.25%	
Mutual Funds	$10 000	(8.5%)	
CSBs	$15 000	4.75%	
TOTALS			

12. Qudsia purchased a car for $21 900. Over the years, she has tracked its value. Her data is summarized in the following table.

YEAR	VALUE
0	$21 900
1	$14 000
2	$11 500
3	$9500
4	$7500
5	$6250

③ **a.** Determine the exponential regression equation of this data. Fill in the blank calculator display given.



```
ExpReg
 y=a*b^x
 a=
 b=
 r²=
 r=
```

③ **b.** Predict the value of the car at the end of 8 years and at the end of 10 years using the graph of the regression equation. Show what your calculator displays on the blank displays given.

After 8 Years **After 10 Years**

② **c.** What is the approximate annual rate of depreciation (loss of value)?

Return to page 40 of the Student Module Booklet and continue with Activity 4.

⑫

13. Answer exercise 4 of "Getting Started" on pages 70 and 71 of the Project Book. Complete the following tables to answer this question. Once you have completed the Revised Plant List table, complete the Revised Amount of Topsoil table. **Note:** The rocks for the rock garden have been omitted for this exercise.

Plant	**Linear Coverage or Count**	**Plants Per Metre**	**Cost Per Plant**	**Total Cost**
Cedar	14 m	1	$8.00	$112.00
Boxwood		2		
Bedding		4	$8.00/dozen	
Rhododendron		1		
Bamboo	8			
Maple	5			
Willow	2			
Water lily	8			
			TOTAL	

Revised Plant List

Plant	Linear Coverage or Count	Plants Per Metre	Cost Per Plant	Total Cost
Cedar		1	$8.00	
Boxwood		2		
Bedding		4	$8.00/dozen	
Rhododendron		1		
Bamboo				
Maple				
Willow				
Water lily				
			TOTAL	

Revised Amount of Topsoil

Item	Total Number of Plants	Area (m^2)	Depth (m)	Approximate Volume (m^3)
Lawn	N/A		0.10	
Trees (willows and maples)				
Shrubs	____ Bamboo ____ Cedar ____ Rhododendron			
Boxwood hedges	N/A			
Bedding plants	N/A			
Rock garden	N/A			
			TOTAL	

14. Use the diagram on page 71 of the Project Book to do the following.

② **a.** Estimate the volume of water needed to fill the pond. Round your answer to the nearest tenth.

④ **b.** Estimate the total amount of waterproofing material needed for the entire pond. Round your answer to 2 decimal places.

① **c.** How much will it cost to waterproof the entire pond if the material costs $\$8/\text{m}^2$?

④ **15.** Answer exercise 6 of “Getting Started” on page 71 of the Project Book. Use the following chart to record your answers.

Labour	Cost Per Hour ($)	Number of Hours	Total Cost ($)
Designer	100		
Pond Technician			
Gardener 1		40	
Gardener 2		40	
		TOTAL	

16. Answer exercise 7 of “Getting Started” on pages 72 and 73 of the Project Book. You may use the spreadsheet *GARDEN* on the Applied Mathematics 30 CD as a reference.

① **Project Book exercise 7.a.:** ____________________

____

① **Project Book exercise 7.b.:** ____________________

____

① **Project Book exercise 7.c.:** ____________________

① **Project Book exercise 7.d.:** ____________________

① **Project Book exercise 7.e.:** ____________________

____

____

① **Project Book exercise 7.f.:** ____________________

____

⑤

17. Complete the *GARDEN* spreadsheet using the information given in this project and your Revised Plant List in question 13 of this Assignment Booklet. In the space provided, attach a printout of your spreadsheet showing the numerical data and a printout showing all of the formulas.

Submit your completed Assignment Booklet 4A to your teacher for assessment.
Then return to page 42 of the Student Module Booklet and continue with Activity 4.

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ASSIGNMENT BOOKLET 4B

MAT3038 Applied Mathematics 30
Module 4: Activities 5 and 6 Assignment, Module Review Assignment, and Module Project

FOR STUDENT USE ONLY

Date Assignment Submitted: ____________________

Time Spent on Assignment: ____________________

(If label is missing or incorrect)

Student File Number: ____________________

Module Number: ____________

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Assignment Grading: ____________

Graded by: ____________

Date Assignment Received:

Student's Questions and Comments

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Module

4

Applied Mathematics 30

PERSONAL FINANCE

ASSIGNMENT BOOKLET 4B

Learning Technologies Branch

Alberta LEARNING

FOR TEACHER'S USE ONLY

Summary

	Total Possible Marks	Your Mark
Activities 5 and 6 Assignment	55	
Module Review Assignment	50	
Module Project	40	
	145	

Teacher's Comments

Applied Mathematics 30
Module 4: Personal Finance
Assignment Booklet 4B
Activities 5 and 6 Assignment, Module Review Assignment, and Module Project
Learning Technologies Branch
ISBN 0-7741-2230-7

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Students	✓
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Other	

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ASSIGNMENT BOOKLET 4B
APPLIED MATHEMATICS 30: MODULE 4
ACTIVITIES 5 AND 6 ASSIGNMENT, MODULE REVIEW ASSIGNMENT, AND MODULE PROJECT

Your mark for this module will be determined in part by how well you do your assignments.

This Assignment Booklet is worth 145 marks out of the total 235 marks for the assignments in Module 4. The value of each assignment and each question is stated in the left margin.

Work slowly and carefully. If you have difficulty, go back and review the appropriate topic.

Be sure to proofread your answers carefully.

(55)

Activities 5 and 6 Assignment

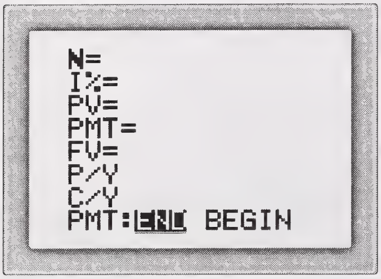
Read all parts of your assignment carefully and record your answers in the appropriate places. Clearly show how you arrived at your answers by showing your work.

③ **1.** Complete exercise 6 of "Investigation 1: Which House Can You Afford?" on page 185 of the textbook. You will need your results from exercises 1 to 5 of this investigation.

Return to page 46 of the Student Module Booklet and continue with Activity 5.

2. Answer exercises 1.c. and 3.d. of “Exercises: Checking Your Skills” on pages 187 and 188 of the textbook.

③ **Textbook exercise 1.c.:**



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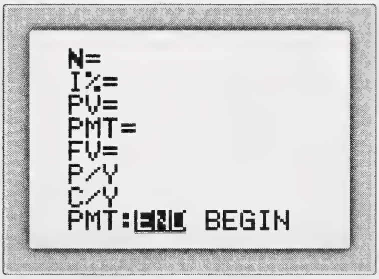
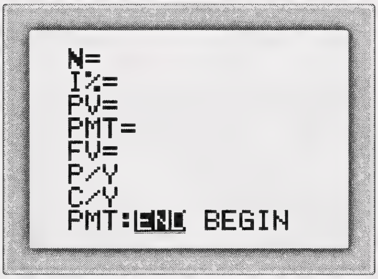
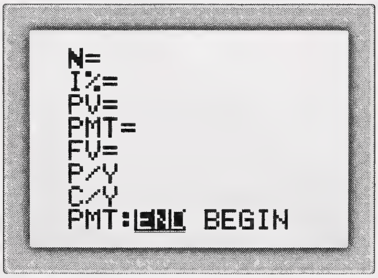
⑤ **Textbook exercise 3.d.:**

3. Answer exercises 5.b. and 5.c. of “Exercises: Checking Your Skills” on page 189 of the textbook. To answer this exercise, complete the following tables and fill in the blank displays given.

⑨

Textbook exercise 5.b.:

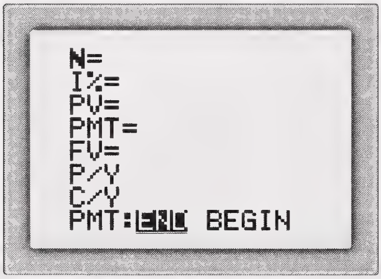
Amortization Period (years)	Monthly Payments	Total Payments
15	 N= I%= PV= PMT= FV= P/Y C/Y PMT:END BEGIN Payment =	
20	 N= I%= PV= PMT= FV= P/Y C/Y PMT:END BEGIN Payment =	
25	 N= I%= PV= PMT= FV= P/Y C/Y PMT:END BEGIN Payment =	

Comparing Amortization Periods (years)	Total Savings
20 vs 25	
15 vs 25	
15 vs 20	

② **Textbook exercise 5.c.:**

Return to page 49 of the Student Module Booklet and continue with Activity 5.

③ **4.** In exercise 1 of "Exercises: Checking Your Skills" on page 194 of the textbook, what is the monthly mortgage payment? Fill in the display given to show your calcualtions.



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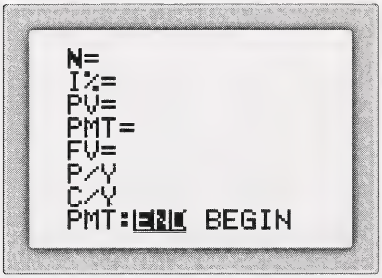
5. Jenna and James have saved $20 000 towards a down payment on a new home. The current mortgage rate is 7%.

③ **a.** What will their monthly mortgage payment be if they purchase a $180 000 home, amortized over 25 years? Fill in the display.



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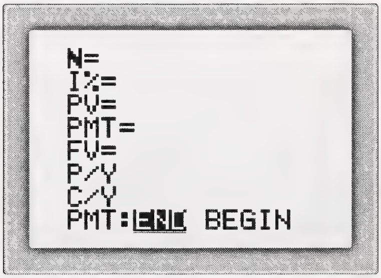
③ **b.** If they could afford to pay an additional $110.22 a month, by how many months would they shorten the amortization period?



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④ **c.** How much would they save altogether if they decide to pay the additional $110.22 a month?

④ **6.** Alice has a savings account that pays 6% annual interest compounded monthly. What is the effective annual interest rate? Round your answer to 2 decimal places.

7. Betty and Marcus must decide whether they will buy a home or rent a friend's condo. They believe they will live in the community where they currently work for 10 years.

They have $25 000 for a down payment and could mortgage the balance at 7% over 25 years. The house they are considering is listed for $180 000. Taxes are $180 a month; insurance is $500 a year; natural gas is $175 a month; and hydro is $150 a month. They estimate maintenance would be another $125 a month.

If they rent the condo, they will invest the $25 000 so it will give a return of 5.25%, compounded annually, after taxes. They will also invest the difference between the monthly cost for the house and the $750 monthly cost for the condo. Insurance is $350 a year, natural gas will be about $120 a month, and other utilities will be about another $100 a month.

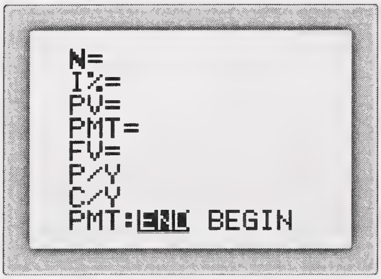
They estimate that the value of the home will appreciate 2% a year, while inflation for rent and utilities will be 5% annually.

⑧ **a.** At the end of 10 years, would they be better off having purchased their home or renting the condo? By how much? Use the spreadsheet *RENTBUY*, and attach a printout of the relevent areas of your spreadsheet in the spaces provided.

(More space is provided on the next page.)

⑤ **b.** If the cost of renting was $1000 per month, how would the results change and by how much?

③ **8.** The interest rate for a mortgage amortized over 20 years is 4.875%. What would the monthly payment be for a $60 000 mortgage? Fill in the blank display given to show your calculations.



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Return to page 53 of the Student Module Booklet and continue with Activity 6.

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Module Review Assignment

Read all parts of your assignment carefully and record your answers in the appropriate places. Clearly show how you arrived at your answers by showing your work.

Answer questions 1 to 13 in this assignment on the answer sheet provided on page 17 of this Assignment Booklet. The answer sheet is similar to the one that will be used on the Diploma Examination for Applied Mathematics 30. Read the following information before proceeding.

Multiple Choice

- Decide which of the choices **best** completes the statement or answers the question.
- Locate that question number on the separate answer sheet provided, and fill in the circle that corresponds to your choice.

Example

This assignment is for the subject of

A. biology
B. physics
C. chemistry
D. mathematics

Answer Sheet

Ⓐ Ⓑ Ⓒ ●

Numerical Response

- Record your answer on the answer sheet provided by writing it in the boxes and then filling in the corresponding circles.
- If an answer is a value between 0 and 1 (e.g., 0.7), then be sure to record the 0 before the decimal place.
- **Enter the first digit of your answer in the left-hand box. Any boxes on the right that are not needed are to remain blank.**

Examples

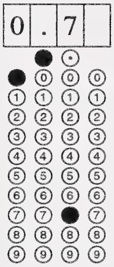
Calculation Questions and Solutions

The value of $\tan 35°$, to the nearest tenth, is ________.

(Record your answer in the numerical-response section on the answer sheet.)

Calculator value: 0.700 207 5
Value to be recorded: 0.7

Record 0.7 on the answer sheet. ⟶



A particular matrix operation produces the equation

$$2\begin{bmatrix} 1 & 0.5 \\ 1.5 & 4 \end{bmatrix} = \begin{bmatrix} a & b \\ c & 8 \end{bmatrix}$$

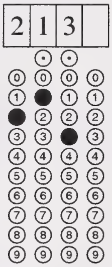
In the equation above, the value of

a is ________ (Record in the **first** column.)
b is ________ (Record in the **second** column.)
c is ________ (Record in the **third** column.)

(Record all **three digits** of your answer in the numerical-response section on the answer sheet.)

Value to be recorded: 213

Record 213 on the answer sheet. ⟶



Correct-Order Question and Solution

Four different sets of data produce the following standard deviations.

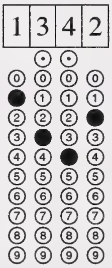
1 0.3 **2** 2.4
3 1.6 **4** 1.9

When these four standard deviations are arranged in order from **lowest** to **highest**, the order is ________, ________, ________, and ________.

(Record all **four digits** of your answer in the numerical-response section on the answer sheet.)

Value to be recorded: 1342

Record 1342 on the answer sheet. ⟶



Use the following information to answer questions 1 and 2.

The following spreadsheet shows the beginning of an amortization table for five equal monthly payments to be made on a $900 loan with an interest rate of 1% per month.

	A	B	C	D	E
1	Payment Number	Payment	Interest Payment	Payment to Principal	Remaining Balance
2	1	$155.29	$9.00	$146.29	$753.71
3	2	$155.29	$7.54	$147.75	$605.96
4	3	$155.29			
5	4				
6	5				

② **1.** How much of payment number 3 is payment toward the principal?

A. $147.75
B. $149.23
C. $155.29
D. $161.35

② **2.** Which of the following formulas can be used to calculate the value of cell D4?

A. =B4+C4
B. =E3–B4
C. =B4–0.1*E3
D. =B4–0.01*E3

Use the following information to answer questions 3 and 4.

Uma has invested $20 000 with an investment firm. In the first year, her portfolio gives the following returns.

Type	**Percent Invested**	**First-Year Profit**
GICs	20%	4%
Blue-chip stocks	50%	9.25%
High-risk stocks	30%	–7.5%

② **3.** For Uma's portfolio, the rate of return to the nearest tenth is

A. 20.8%
B. 5.8%
C. 3.2%
D. 1.9%

② **4.** Uma's total return for the first year is

A. \$317.50
B. \$635.00
C. \$1066.50
D. \$1150.00

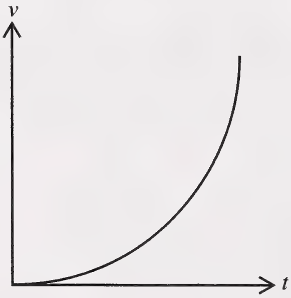
② **5.** A couple plans to buy a house for \$175 000. They will make a \$30 000 down payment and take out a 25-year mortgage at 7.5% per annum, compounded semi-annually. The monthly payments on the mortgage will be \$1060.74 per month.

The total amount of interest that the couple will pay for this mortgage is

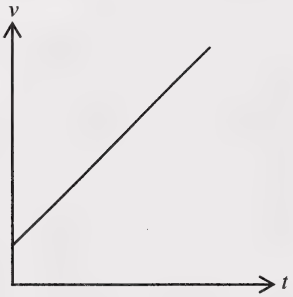
A. \$188 125
B. \$173 225
C. \$155 875
D. \$143 225

② **6.** In most cases, a house is an increasing asset whose value, *v*, increases exponentially over time, *t*. Which of the following graphs represents the pattern of the expected value of a house?

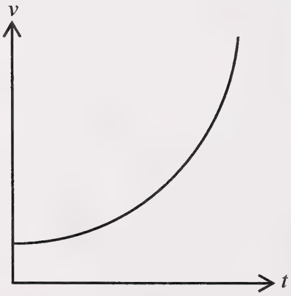
A.



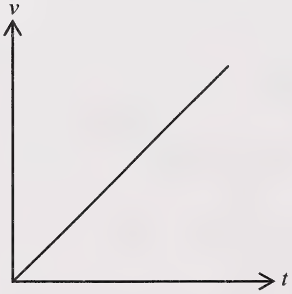
B.



C.



D.



②

7. To buy a new boat, a person takes a loan of $7400 over 60 months at 8.75% per annum, compounded monthly.

Which of the following spreadsheets should the person use to correctly calculate the balance in cell F2?

A.

	A	B	C	D	E	F
1	**Months**	**Loan**	**Interest Rate**	**Interest Charge**	**Monthly Payment**	**Balance**
2	1	$7,400.00	0.0875	=(B2*C2)/12	$152.72	=B2-D2-E2
3	2	=F2	0.0875		$152.72	

B.

	A	B	C	D	E	F
1	**Months**	**Loan**	**Interest Rate**	**Interest Charge**	**Monthly Payment**	**Balance**
2	1	$7,400.00	0.0875	=(B2*C2)	$152.72	=B2+D2-E2
3	2	=F2	0.0875		$152.72	

C.

	A	B	C	D	E	F
1	**Months**	**Loan**	**Interest Rate**	**Interest Charge**	**Monthly Payment**	**Balance**
2	1	$7,400.00	0.0875	=(B2*C2)/12	$152.72	=B2+D2-E2
3	2	=F2	0.0875		$152.72	

D.

	A	B	C	D	E	F
1	**Months**	**Loan**	**Interest Rate**	**Interest Charge**	**Monthly Payment**	**Balance**
2	1	$7,400.00	0.0875	=(B2*C2)	$152.72	=B2+D2+E2
3	2	=F2	0.0875		$152.72	

②

8. Hayden currently has $30 000 in his investment portfolio. He has $3100 in cash equivalents, $9600 in fixed-income investments, and $17 300 in equity investments. When Hayden received a $5000 bonus at work, his financial advisor suggested that he should reallocate his total investment portfolio as follows:

Cash Equivalents: 10%
Fixed Income: 40%
Equity Investments: 50%

If Hayden wishes to follow his financial advisor's advice, the amount of the $5000 bonus that he should add to his fixed-income investments so they comprise 40% of his total investments is

A. $1400
B. $2400
C. $3840
D. $4400

②

9. Betty wants to take out a mortgage for $115 000, amortized over 25 years. She is considering two options. One option is to make 12 monthly payments of $770.30 for 25 years. A second option is to make 52 weekly payments of $177.40 for 25 years.

The amount that Betty could save over the full amortization of the mortgage by making the weekly payments instead of the monthly payments is

A. $470.00
B. $592.90
C. $60.70
D. $18.80

Numerical Response

②

1. The median price for houses in Calgary every two years from 1988 to 1998 is given.

Number of Years After 1988	0	2	4	6	8	10
Price ($)	127 526	127 621	132 868	134 643	157 353	176 316

These figures may be represented by an equation of the form $y = ax^2 + bx + c$.

The value of *a* in the equation, rounded to the nearest whole number, is ____________.

(Record your answer in the numerical-response section on the answer sheet.)

② **10.** The following spreadsheet shows the inventory statement for some of the items available at a convenience store.

	A	B	C	D	E	F	G	H
1	**Inventory Statement**							
2	**Item**	**Number Purchased**	**Wholesale Price**	**Total Cost**	**Number Sold**	**Retail Price**	**Total Sales**	**Total Profit**
3	Potato Chips	500	$0.45	$225.00	420	$0.85	$357.00	$132.00
4	Chocolate Bars	800	$0.52	$416.00	641	$0.75	$480.75	$64.75
5	2L Pop	600	$1.80	$1,080.00	508	$3.25	$1,651.00	$571.00
6	Gum	1,600	$0.38	$608.00	1,275	$0.80	$1,020.00	$412.00
7	Total	3,500		$2,329.00	2,744		$3,508.75	$1,212.95

What formula could have been used to determine the value in cell H4?

A. =B4*C4
B. =B4–E4
C. =E4*F4
D. =G4–D4

② **11.** Bill takes out an $8000 loan at 8% per annum, compounded monthly, for 1 year. The following chart shows a partial loan payment schedule.

Month	**Balance**	**Interest**	**Payment**	**New Balance**
1	$8000.00	$53.33	$695.91	$7357.42
2	$7357.42	i	$695.91	

What is the value of i?

A. $55.67
B. $53.33
C. $49.05
D. $44.41

Use the following information to answer questions 12 and 13 and numerical-response question 2.

John is considering whether to buy or lease a car. The price of the car he is interested in is \$25 500.00. Regardless of the option he chooses, John will make a down payment of \$3000.00.

Option 1: purchase the car and make payments of \$557.25/month for 48 months

Option 2: lease the car and make payments of \$307.50/month for 48 months, after which time still owing \$12 850.00.

② **12.** If John wants to own the car at the end of 48 months, he should ___*i*___ the car because he will save ___*ii*___.

Which row completes this statement?

	i	*ii*
A.	lease	\$862
B.	buy	\$862
C.	lease	\$11 988
D.	buy	\$11 988

② **13.** It is predicted that the value of John's car will depreciate every year for the first four years according to the table on the right.

Year	Value
0	\$25 500
1	\$17 850
2	\$16 065
3	\$14 459
4	\$13 012

If John uses an exponential regression equation to determine the value of his car in the future, he will find the average rate of **depreciation** to be

A. 14.4% per year
B. 49.0% per year
C. 51.0% per year
D. 85.6% per year

Numerical Response

② **2.** What is the value of John's car after 10 years? Round your answer to the nearest dollar.

(Record your answer in the numerical-response section on the answer sheet.)

Answer Sheet

1. Ⓐ Ⓑ Ⓒ Ⓓ
2. Ⓐ Ⓑ Ⓒ Ⓓ
3. Ⓐ Ⓑ Ⓒ Ⓓ
4. Ⓐ Ⓑ Ⓒ Ⓓ
5. Ⓐ Ⓑ Ⓒ Ⓓ
6. Ⓐ Ⓑ Ⓒ Ⓓ
7. Ⓐ Ⓑ Ⓒ Ⓓ
8. Ⓐ Ⓑ Ⓒ Ⓓ
9. Ⓐ Ⓑ Ⓒ Ⓓ
10. Ⓐ Ⓑ Ⓒ Ⓓ
11. Ⓐ Ⓑ Ⓒ Ⓓ
12. Ⓐ Ⓑ Ⓒ Ⓓ
13. Ⓐ Ⓑ Ⓒ Ⓓ

Numerical Response

1. ☐☐☐☐

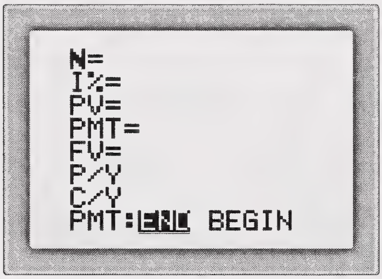
	⊙	⊙	
⓪	⓪	⓪	⓪
①	①	①	①
②	②	②	②
③	③	③	③
④	④	④	④
⑤	⑤	⑤	⑤
⑥	⑥	⑥	⑥
⑦	⑦	⑦	⑦
⑧	⑧	⑧	⑧
⑨	⑨	⑨	⑨

2. ☐☐☐☐

	⊙	⊙	
⓪	⓪	⓪	⓪
①	①	①	①
②	②	②	②
③	③	③	③
④	④	④	④
⑤	⑤	⑤	⑤
⑥	⑥	⑥	⑥
⑦	⑦	⑦	⑦
⑧	⑧	⑧	⑧
⑨	⑨	⑨	⑨

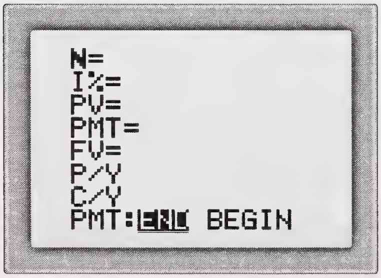
④ **14.** Alex has deposited $10 500 in an account bearing 4% annual interest, compounded monthly. Use the formula for compound interest to determine the amount he will have after 10 years.

③ **15.** Using the TVM Solver, determine how much must be invested today to have $10 000 for college in 5 years time if the rate is 5.25%, compounded quarterly. Enter what appears on your display in the blank display given.



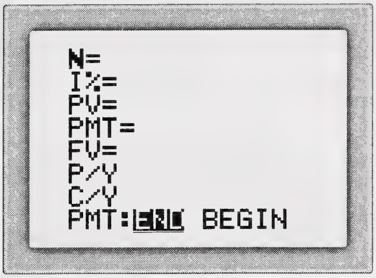
```
N=
I%=
PV=
PMT=
FV=
P/Y
C/Y
PMT:END BEGIN
```

③ **16.** **a.** When Christa turned 35, she started to save for her retirement by depositing $400 at the end of every month into an account bearing 6% annual interest, compounded monthly. How much will she have when she turns 55? Use the TVM Solver and enter what appears on your display in the blank display given.



```
N=
I%=
PV=
PMT=
FV=
P/Y
C/Y
PMT:END BEGIN
```

③ **b.** How much more would she have if she had started when she turned 25?



```
N=
I%=
PV=
PMT=
FV=
P/Y
C/Y
PMT:END BEGIN
```

17. Harjiwan purchased a painting for \$3500 as a long-term investment. Over the years, he has tracked its value. The value of his painting in the years following its purchase is shown in the following chart.

Year	Value
0	\$3500
1	\$3750
2	\$4025
3	\$4350
4	\$4700
5	\$5150
6	\$5525
7	\$6075
8	\$6650

② **a.** What is the exponential regression equation of this data?

____

② **b.** Predict the value of Harjiwan's painting at the end of 20 years and at the end of 40 years.

② **c.** How accurately do you feel the values in question 9.b. will predict the future value of the painting? Explain your reasoning.

① **d.** What is the approximate annual rate of appreciation (gain in value) for this asset?

Return to page 54 of the Student Module Booklet and continue with the Module Review.
If your teacher has indicated that the Module 4 project does not need to be completed, submit Assignment Booklet 4B to your teacher for assessment.

㊵

Module Project: Lease or Buy a Car?

Your teacher may not require you to complete all the projects in this Applied Mathematics 30 course. Contact your teacher and check whether you need to complete the Module 4 project, Lease or Buy a Car?, as part of your assessment.

If you are required to complete this project, **read all parts of the project carefully and record your answers in the appropriate places. Clearly show how you arrived at your answers by showing your work.**

Your Module 4 project is Lease or Buy a Car? A major aspect of this project involves collecting information on purchasing or leasing a vehicle of your choice. You may have to collect this information from a variety of independent sources, such as vehicle brochures, newspaper or magazine advertisements, salespeople, consumer reports, and the Internet.

Once you have collected the information, you will enter it into the *LEASEBUY* spreadsheet given on the Applied Mathematics 30 CD. This spreadsheet will help you with part of the analysis on which you will base your decision about leasing or buying the vehicle of your choice.

Your work in this project Booklet will be a final version of the work you did on the project throughout the Student Module Booklet.

④ **1.** Briefly describe the vehicle you have chosen. Include the options that you intend to select. Why do you feel this vehicle is right for you?

④ **2.** What safety features are standard? What is the collision rating of this vehicle?

③ **3.** What is the vehicle's fuel-consumption rating? Estimate the number of kilometres that you will drive each month? What will your annual fuel costs be?

④ **4.** How expensive and available are parts and service? What does the warranty cover? How much will regular servicing cost you per year?

② **5.** What insurance coverage will you purchase? What is the annual cost of this coverage? What is the annual registration fee?

① **6.** Including options and freight, what is the price of the vehicle?

7. Answer the following if you were to lease the vehicle.

① **a.** What down payment is required?

① **b.** What other fees and charges must be paid?

② **c.** What is the term of the lease? What is the residual value of the vehicle at the end of the lease?

① **d.** What is the lease interest rate?

① **e.** What are the monthly payments before taxes? including taxes?

③ **f.** How is the residual value calculated?

8. Answer the following if you were to purchase the vehicle.

② **a.** What will your down payment be? How much will you finance? Be sure to include all taxes and other fees and charges.

③ **b.** Over how many months will you finance the vehicle? What are the finance rate and the monthly payments?

⑧ **9.** Enter the information you have collected in the *LEASEBUY* spreadsheet. Will you lease or buy this vehicle? Explain. Attach a printout of the spreadsheet you used in your analysis.

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